RESEARCH REPORT

Effectiveness and specificity of a classroom-based group intervention in children and adolescents exposed to war in Lebanon

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The purpose of this study was to examine the effectiveness and specificity of a classroom-based psychosocial intervention after war. All students (n=2500) of six villages in Southern Lebanon designated as most heavily exposed to war received a classroom-based intervention delivered by teachers, consisting of cognitive-behavioural and stress inoculation training strategies. A random sample of treated students (n=101) and a matched control group (n=93) were assessed one month post-war and one year later. Mental disorders and psychosocial stressors were assessed using the Diagnostic Interview for Children and Adolescents - Revised with children and parents. War exposure was measured using the War Events Questionnaire. The prevalence of major depressive disorder (MDD), separation anxiety disorder (SAD) and post-traumatic stress disorder (PTSD) was examined pre-war, one month post-war (pre-intervention), and one year post-war. Specificity of treatment was determined by rating teachers' therapy diaries. The rates of disorders peaked one month post-war and decreased over one year. There was no significant effect of the intervention on the rates of MDD, SAD or PTSD. Post-war MDD, SAD and PTSD were associated with pre-war SAD and PTSD, family violence parameters, financial problems and witnessing war events. These findings have significant policy and public health implications, given current practices of delivering universal interventions immediately post-war.

Key words: War, depression, separation anxiety, post-traumatic stress disorder, classroom-based group intervention

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Many models for post-trauma group treatment of children and adolescents have been proposed and implemented in the last two decades, providing guidelines for psychological first aid and intervention (1-4). However, there is little empirical evidence to support the various treatment interventions and a paucity of well-designed studies to examine their effectiveness (5,6). The most robust evidence for efficacy of post-trauma interventions has come so far from randomized controlled studies of individual treatment for child sexual abuse using trauma-focused cognitive-behavioural therapy (CBT) (7). Providing individual therapy on a large scale may not be practical, however, and interventions targeting groups of children are needed.

Studies of group interventions for children and adolescents have been conducted following natural disasters (8-11), man-made disasters (12,13), single-incident stressors (14) and community violence (15). However, many studies are limited in their lack of a control group. Thus, it is difficult to conclude whether the improvement reported in mental health and other psychosocial outcomes was due to the model underlying the intervention itself, to non-specific factors common to all interventions, to non-measured factors related to social support or to the effect of time alone. Additionally, most group intervention studies used child self-ratings only, and none used diagnostic interviews with both child and parents.

The evidence for efficacy of interventions following war and terrorism is even more scant (16). Manual-based programs after terrorist attacks have been used in the United States, but their outcome has not been yet examined (17,18). Models of post-war group and community interventions have also been proposed, but their efficacy has not been investigated (19-23). One study reported improvement on some measures in Bosnian children whose mothers were randomized to receive either weekly group psychosocial support and basic medical care or basic medical care only (24). In a non-controlled study evaluating the effectiveness of trauma/grief-focused group psychotherapy in Bosnian adolescents, a decrease in post-traumatic stress disorder (PTSD), depression, and grief symptoms was reported (25). There was no significant impact of group interventions on self-rated post-traumatic stress and depressive symptoms in severely affected Palestinian children allocated to three different group interventions (26). In a controlled group CBT study of young war-exposed refugees, improvements were not maintained at follow-up two months later (27). In a study of Palestinian children and adolescents from the West Bank and Gaza who received group structured activities and parent training, the post-intervention Child Behavior Checklist scores were significantly lower in the intervention group than controls, but only for girls (28). Other uncontrolled pilot studies included a trial of narrative exposure

therapy for Somali refugee adolescents reporting a decrease in post-traumatic stress and depressive scores (29), a trial of a multimodality program for Kosovan refugee adolescents reporting a decrease in depressive and anxiety symptoms but persistence of PTSD in 3 out of 6 participants (30), and a study of mind-body techniques in 139 Kosovan high-school students also reporting a decrease in post-traumatic stress scores after the intervention (31).

There is therefore a dramatic lack of well-designed controlled studies of group treatment of children and adolescents after trauma (32), and very little is known about the specific aspects of these interventions that may lead to improved outcomes (33).

Southern Lebanon, which has been the scene of war for many decades, was the theater in 1996 of a major military operation in the South and South-West Bekaa regions. Families in their homes or in shelters were exposed to shelling and bombardment by tanks, airplanes and warships lasting for 15 days and resulting in hundreds of fatalities, thousands of casualties, substantial destruction of property and displacement of entire communities. The purpose of this paper is to examine the effectiveness and specificity of a classroom-based psychosocial intervention implemented after that war.

METHODS

Subjects

All students (n=2500, grades 1-9) of six public schools located in six villages designated by the Ministry of Education as most heavily exposed to war received the intervention. Of these students, 116 who were randomly selected to represent different schools and grade levels underwent the evaluation process. The control group consisted of 93 students who were selected from a different group of schools where the intervention was not delivered. Random assignment of students to treatment and control groups was not possible since it was mandated that these particular six schools receive the intervention. Students in treatment and control groups were matched on age, gender and degree of war exposure.

Procedures

The baseline assessment was conducted one month post-war in both subject groups, administering the Diagnostic Interview for Children and Adolescents - Revised (DICA-R) (34) to both subjects and their parents. Interviews were conducted at their respective schools after getting informed written consent from parents. Interviewers were bachelor-level health-care workers from the Ministry of Education who received a four-day training on the interview battery. The DICA-R was adapted to Arabic in its three versions (child, adolescent and parent). Back translation was done by an independent translator followed by pilot field-testing. The final form was adopted after consensus meetings to resolve differences between versions if still present. The diagnostic entities used were major depressive disorder (MDD), separation anxiety disorder (SAD) and PTSD. Diagnoses were established according to DSM-III-R criteria (35). However, the endorsement of functional impairment was required to ensure clinical significance and to be more compatible with the spirit of DSM-IV (36). Some subjects were interviewed 3 weeks post-war and as such the needed 4 weeks duration of PTSD symptoms was not possible to fulfill for all. The diagnostic assessment was repeated one year later.

Psychosocial stressors (serious illness, chronic medical non-psychiatric illness, financial problems, bereavement, family quarrels, fear of being beaten by someone, having been severely beaten by someone, and a family member severely beaten) were assessed at baseline by using the DICA-R.

The nature and magnitude of war exposure were assessed using the War Events Questionnaire (WEQ). This is a face-to-face interview administered to parents, inquiring about the children's exposure and direct witnessing of home destruction and/or physical injury to the child, to family members or to others close to the child. The WEQ was developed and used previously by the authors' team with an inter-rater reliability coefficient ranging from 0.3 to 0.8 (37,38).

Approval for the study was obtained from the Ethics Review Board of St. George Hospital University Medical Center / University of Balamand Faculty of Medicine, Beirut, Lebanon.

Intervention

The intervention was conceptualized after the work of Pynoos and Nader (3), but was adjusted to fit the specific context of the post-war circumstances. It consisted of a combination of cognitive-behavioural strategies and stress inoculation training. Examples of strategies used in the intervention are cognitive restructuring, expression and spontaneous sharing of common fears including individual traumatic experience; focus on problem-solving and coping strategies; use of tools such as drawing, role playing and writing of essays to explore assumptions and beliefs; discussion of bereavement, grief, anxiety, and depression, as well as enhancing help-seeking and the recovery process. These techniques were tailored to the developmental level of the students.

The intervention was delivered by 68 full-time teachers from the selected schools to all 2500 students. Teachers were chosen by each school principal based on their reliability, assertiveness, and the greatest time spent with their students in class. The intervention was delivered in daily sessions of 60 minutes each, taking place over 12 consecutive school days.

Teachers were trained intensively in one day and were

closely supervised every 2-3 sessions subsequently. Training followed a structured manual which informed teachers about the goals of the treatment and the specific sequence of steps to be taken in delivering the intervention. In the last part of the training, teachers were themselves asked to role-play as well as express their own fears, struggles and problems resulting from exposure to war.

Teachers were asked to compile a structured diary, providing a detailed day-by-day description of the intervention sessions, including the content of each session, issues raised, responses of the students, their level of cooperation, students' behaviour during the intervention, and the teachers' own observations and remarks. Six months after the intervention, the research team reviewed the therapy diaries, and rated blindly compliance to the intervention techniques and training instructions. The treatment group was divided into two subgroups: the one in which ratings were above the mean (specific treatment, ST group) and the one in which ratings were below the mean (non-specific treatment, NST group).

Two subjects from the treatment group were lost to follow-up a year later, and diaries for two classrooms related to 13 students were lost. Thus, treatment data on 15 subjects could not be retrieved. There were no significant differences between these subjects and the total treatment sample on demographic variables, psychosocial stressors and prevalence of disorders, except for a lower prevalence of MDD at baseline for subjects with missing data. Results in this paper will be reported only for the 101 students for whom full data sets were available at both phases (ST, n=51; NST, n=50).

Data analyses

The treatment and control groups were compared on demographic characteristics, war exposure, and psychosocial variables using chi-square and t-tests. Generalized estimating equation (GEE) was used to examine the effect of the intervention on MDD, SAD and PTSD. Group, time, and group by time interactions were included in the models controlling for covariates that were found to be significantly different between the treatment and control groups. GEE is a quasi-likelihood estimation technique (39). The procedure accounts for the correlation between observations (same people measured at different time points) by specifying the response covariance matrix and estimating it (40). GEE models were run on SAS V8.0 using the GENMOD procedure with the REPEAT option. All tests were two-tailed and significance was determined at $p<0.05$.

RESULTS

The mean age in the treatment and control groups was 11.7±2.7 and 11.8±3.1 years respectively, with an age range of 6-18 years. Boys and girls were equally represented in the groups. There were more children than adolescents in both groups, which is consistent with the distribution of the population of students from which they were randomly selected (Table 1).

There was no significant difference between the two groups concerning psychosocial stressors or war events. Almost 20% of subjects in both treatment and control groups directly witnessed partial or total destruction of their own home or the home of a close person and/or witnessed fatal or non-fatal injuries of a family member or other close person. About 25% of subjects in both groups heard of the occurrence of the above war events but did not witness them (Table 1).

In both groups, there was a peak in the rates of disorders one month post-war and a decrease over one year. There was no significant difference between the two groups with respect to lifetime, baseline or one-year follow-up rates of MDD, SAD and PTSD (Table 2).

Table 1 Demographic and psychosocial variables and war exposure in treatment and control groups

Variable	Treatment group (n=101)	Control group (n=93)	χ^2	p
Gender (% males)	51.5	50.5	0.017	0.895
Age (% less than 12 years)	58.4	59.1	0.010	0.918
Ever seriously ill (%)	38.0	34.4	0.268	0.604
Chronic medical illness (%)	20.2	15.0	0.872	0.350
Family quarrels (%)	33.7	47.3	3.752	0.053
Financial problems (%)	57.4	55.9	0.045	0.831
Bereavement (%)	47.5	55.9	1.364	0.243
Fear of being beaten (%)	45.5	40.9	0.433	0.511
Ever severely beaten (%)	24.8	29.0	0.452	0.501
Family member ever severely beaten (%)	19.8	23.7	0.424	0.515
War events				
Witnessed any event (%)	19.8	19.4	0.006	0.937
Heard of any event (%)	25.7	25.8	0.0001	0.991

Table 2 Prevalence (%) of mental disorders over study periods for treatment (n=101) and control (n=93) groups

Disorder	Lifetime (pre-war)		Baseline (4 weeks post-war)		One-year follow-up (12 months post-war)	
	Treatment group	Control group	Treatment group	Control group	Treatment group	Control group
Major depressive disorder	10.0	3.3	32.7	26.9	16.8	8.6
Separation anxiety disorder	4.0	4.3	22.8	17.2	14.3	6.4
Post-traumatic stress disorder	2.0	3.2	27.7	31.2	1.0	2.2

Table 3 Generalized estimating equation analysis in treatment (n=101) and control (n=93) groups: treatment/time effect

	Major depressive disorder		Separation anxiety disorder		Post-traumatic stress disorder	
	β (± SE)	p	β (± SE)	p	β (± SE)	p
Group (treatment vs. control)	-0.25 (± 0.37)	0.501	-0.44 (± 0.41)	0.284	0.22 (± 0.34)	0.517
Time	-0.57 (± 0.83)	0.496	-0.09 (± 0.96)	0.923	-4.29 (± 2.17)	0.048
Group x time interaction	-0.47 (± 0.58)	0.420	-0.62 (± 0.64)	0.337	0.36 (± 1.23)	0.773

Table 4 Generalized estimating equation analysis in treatment (n=101) and control (n=93) groups: covariates (only significant relationships are reported)

	Major depressive disorder		Separation anxiety disorder		Post-traumatic stress disorder	
	OR	95% CI	OR	95% CI	OR	95% CI
Pre-war separation anxiety disorder			11.6	3.7-36.6		
Pre-war post-traumatic stress disorder					11.5	1.1-121.0
Family quarrels	3.1	1.6-5.6	2.3	1.1-4.9		
Fear of being beaten	2.6	1.4-4.7	5.4	2.7-10.8	2.2	1.1-4.4
Financial problems					3.2	1.5-6.7
Witnessing any war event	2.1	1.1-4.1	2.9	1.4-6.1	2.2	1.0-4.7

In the GEE analyses, we found no treatment effect. Group differences were not significant for all three disorders. Time was significant only for PTSD. All group by time interactions were not significant (Table 3). When group by time interactions were removed from the model, time became significant for MDD (β=-1.27±0.27; p<0.0001) and SAD (β=-0.95±0.31; p=0.003). Pre-war SAD and PTSD, family violence parameters, financial problems and witnessing war events were all associated with post-war disorders (Table 4).

The ST and NST treatment groups did not differ significantly with respect to gender, war exposure, and most of the psychosocial stressors. However, the ST group included more children (72.6% vs. 44.0%, χ^2=8.47, df=1, p=0.003), more subjects suffering from chronic medical illness (30.6% vs. 10.0%, χ^2=6.52, df=1, p=0.01), more having ever been seriously ill (50.0% vs. 26.0%, χ^2=6.11, df=1, p=0.01), more having ever been beaten (33.3% vs. 16.0%, χ^2=4.07, df=1, p=0.04) and more reporting the death of a close person (64.7% vs. 40.0%, χ^2=6.18, df=1, p=0.01).

Since we found no treatment effect, we next examined the effect of specificity of treatment by comparing outcomes between the ST and NST groups controlling for differences between the groups at baseline. We found a statistically significant change in the rates between the groups only for MDD (time and group by time interaction), favoring outcome in NST (Table 5). Covariates found to be significantly related to MDD were younger age (OR = 2.8; 95% CI = 1.17-6.55), family quarrels (OR = 4.5; 95% CI = 2.03-10.18), and fear of being beaten (OR = 7.4; 95% CI = 2.98-18.36). Covariates significantly related to SAD were pre-war SAD (OR = 67.4; 95% CI = 6.29-720.76), family quarrels (OR = 4.0; 95% CI = 2.30-9.26), fear of being beaten (OR = 6.7; 95% CI = 2.30-19.81) and hearing of the injury of a close person (OR = 2.7; 95% CI = 1.21-6.12). Covariates significantly related to PTSD were pre-war SAD (OR = 7.4; 95% CI = 2.69-20.24), pre-war PTSD (OR = 8.2; 95% CI = 3.62-18.49) and family quarrels (OR = 4.5; 95% CI = 2.07-9.80).

Table 5 Generalized estimating equation analysis in specific (n=51) and non-specific (n=50) treatment groups: treatment/time effect

	Major depressive disorder		Separation anxiety disorder	
	β (± SE)	p	β (± SE)	p
Group (specific vs. non-specific treatment)	0.14 (± 0.54)	0.795	0.34 (± 0.58)	0.555
Time	-4.64 (± 1.47)	0.001	-3.22 (± 1.70)	0.058
Group x time interaction	2.00 (± 0.88)	0.022	1.48 (± 0.99)	0.134

Significant covariates are mentioned in the text
There were not enough cases of PTSD to conduct the specificity analyses

DISCUSSION

This is the first study to evaluate the effectiveness and specificity of school-based group treatment after war trauma in a representative community sample using structured interviews, multiple informants and a control group. The results demonstrate that, at best, there was no significant treatment effect one year after war trauma, but that specific aspects of the intervention may have had deleterious effects on some.

While the studies of interventions for children in post-war settings have so far demonstrated either short-lived (27) or limited (24-28) benefits, our study confirms the absence of positive impact of psychosocial interventions reported in a controlled intervention in Palestine (26). The decrease in PTSD rates over time is consistent with results of prospective studies of children post-war (16).

The results of this study should be interpreted in the light of several limitations. First, although students in the treatment and control groups were matched on age, gender and

war exposure, there was no group randomization, and the control group was not selected from the same restricted pool of students who received the intervention. In addition, it is conceivable that there may have been other differences between the two samples which were not measured, for instance concerning social support. Despite the devastation and loss, the entire Lebanese population was mobilized to support displaced families in shelters and upon returning to their villages later. Although we do not have any evidence that the two samples received different degrees of support, we do not have evidence to the contrary. The two samples may have also differed in risk factors proven to be important in the literature which were not measured, including parental mental health (1), the child's coping style (41), and the child's political beliefs and commitment (42).

A second limitation involves training teachers who had no mental health background and whose own mental state following the war trauma was a factor we could not control for completely (despite addressing it in their training) which might have biased some of their interactions with their students. However, in the absence of trained professionals for emergency interventions, mobilizing teachers was the best alternative to reach the largest number of students. Although we attempted to control for the quality of delivered treatment by frequent supervision sessions and subsequently rating the teachers' therapy diaries, a better approach could have been used, such as taping sessions and reviewing them to assess the reliability of teachers and identify those who needed to be retrained. However, this was not feasible under the circumstances.

A third limitation involves measurement of outcomes of treatment one year after intervention. It is likely that the intervention may have had short-term therapeutic effects had we measured outcomes sooner. On the other hand, students may have improved in other psychosocial domains which we did not measure such as coping skills and adaptive functioning.

Some other methodological limitations of the study design include the absence of self-rating scales by parents and children to bolster findings from structured interviews for detection of milder or sub-threshold cases, but again this was not possible with the limited resources and the time allocated. Additionally, the relation between mental disorders and the 1996 war events could have been shaped by exposure to other traumatic war events during the course of the long-standing conflict in Southern Lebanon.

Our study is methodologically unique in its design, where neither students, teachers nor interviewers knew the specificity of treatment group, which was determined *a posteriori*. This eliminated any bias which may arise when assigning therapists to a control group (e.g., knowing they are delivering "supportive therapy" as opposed to those delivering a specific intervention) (43). Additionally, using structured interviews with both parents and children decreased the chance of missing important clinical data endorsed by one informant and not the other, which has been the case in most war-related studies of children and adolescents so far.

The fact that there was a significant difference in the change between specific and non-specific treatment for MDD, where none existed between treatment and control groups, suggests the possibility that specific aspects of intervention might have been deleterious for some subjects. To investigate this further, we examined the school and classroom distribution of all students with disorders at follow-up. Indeed, we found that the majority of students with MDD and SAD at follow-up in ST (58.8% and 71.4%, respectively) came from a single classroom (grade 3) in one particular school. Students in this classroom were more exposed to war events than another selected classroom in the same school and all other classrooms in other schools. This high war exposure may not have been the sole contributing factor: other factors particular to this specific classroom could have included the teacher's psychological profile or contamination effects among the students themselves within this classroom. We, therefore, reanalyzed the data excluding students selected from this classroom, finding that the outcome between ST and NST was similar.

Treatment outcome apart, our study demonstrated the feasibility of carrying out a large-scale community intervention targeting students in their schools under dire circumstances.

In conclusion, establishing the effectiveness of community group treatment of children and adolescents exposed to war needs additional careful investigation, since well-designed controlled group psychotherapy studies in war-affected populations are still in short supply to allow definitive conclusions. Replicating our results would be of paramount importance from a public health and policy planning perspective, given the current practices of governmental and non-governmental organizations to immediately implement very costly large-scale interventions after disasters and wars without sufficient proof of long-term benefits.

While current recommendations for post-disaster interventions revolve around integrating psychosocial and mental health services into a larger scheme of delivery of humanitarian aid to affected populations (44,45), the state of science is still far from determining the effectiveness or specificity of either "social" or "psychological" components of these interventions. The debate remains open on issues of timing of intervention and the targeted groups of children and adolescents. Our findings suggest that it may not be advisable to intervene in traumatized populations immediately, but rather a few months later. By then, it is probably more cost-effective to screen for cases remaining ill, targeting them for more focused treatment at that point.

Another recommendation based on our findings is not to limit interventions to PTSD only, but to include other disorders that arise after wars and disasters, possibly with greater frequency than PTSD. In addition to MDD and SAD, other psychological symptoms and conditions may need to be addressed in planning services for children after war (46). Findings from other studies conducted by our group highlight the need to address externalizing and im-

pulse-control disorders as well (47,48).

Finally, given the fact that pre-war disorders and concurrent psychosocial stressors such as family violence and financial problems were strong predictors of post-war disorders, it is imperative to identify children and adolescents at highest risk for more targeted interventions.

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